FIFTH ANNUAL MEETING OF THE OHIO SECTION.

The fifth annual meeting of the Ohio Section of the Mathematical Association of America was held at the Ohio State University, Columbus, on the afternoon and evening of April 2, 1920, in connection with the meetings of the Ohio College Association. The widely advertised program attracted a large attendance not only of mathematicians, but also of physicists, other scientists and educators. The attendance included the following thirty-five members of the Association:

R. B. Allen, W. E. Anderson, G. N. Armstrong, C. L. Arnold, C. B. Austin, Grace M. Bareis, L. A. Bauer, W. S. Beckwith, R. D. Bohannan, R. L. Borger, W. D. Cairns, V. B. Caris, E. H. Clarke, O. L. Dustheimer, T. M. Focke, Harris Hancock, William Hoover, H. W. Kuhn, A. C. Lunn, C. N. Mills, C. N. Moore, C. C. Morris, A. D. Pitcher, J. B. Preston, S. E. Rasor, C. Lois Rea, Hortense Rickard, W. G. Simon, K. D. Swartzel, T. Elmer Trott, J. H. Weaver, R. B. Wildermuth, F. B. Wiley, D. T. Wilson, and E. I. Yowell.

Professor R. L. BORGER occupied the chair, being relieved for an interval by Professor S. E. RASOR. Many of those in attendance at the afternoon meetings attended the dinner at the Ohio Union with the Ohio College Association, the dinner being followed by addresses of interest to college teachers. This gathering adjourned at 8.30 to attend Dr. Bauer's lecture of the evening program.

At the business meeting the Secretary reported that the membership of the Section is seventy, two more than last year, nine names having been removed from the roll and eleven added. Besides there are eight institutional members. The following officers were elected: Chairman, Professor S. E. RASOR, Ohio State University; Secretary-Treasurer, Professor G. N. ARMSTRONG, Ohio Wesleyan University; Third member of the executive committee, Professor A. D. PITCHER, Western Reserve University.

The following program was carried through:

(1) Address of the chairman: "Some geometric methods for curve tracing" by Professor R. L. BORGER;

(2) "The theory of relativity" by Professor A. C. LUNN;

(3) Symposium on Number (2) and related questions by (*a*) F. C. BLAKE, Professor of Physics, Ohio State University; (*b*) Dr. C. W. CHAMBERLAIN, President of Denison University; (*c*) D. C. MILLER, Professor of Physics, Case School of Applied Science; (*d*) Members of the Section and visitors.

(4) "The deflection of light observed during the solar eclipse of May 29, 1919, and its bearing upon the Einstein theory of gravitation" (illustrated lecture) by Dr. L. A. BAUER;

(5) Informal social and round table meeting at the Ohio Union following the evening lecture. Topic: "Freshman mathematics to meet the changing high school mathematics as presented for entrance to college." Discussion led by Mr. H. M. BEATTY, Ohio State University.

Abstracts of the papers and discussions follow below. The abstracts are numbered to correspond to the titles in the list above.

1. In this paper, Professor Borger presents two constructions: (*a*) The Peano construction for curves in rectangular coördinates; (*b*) A geometric method for the construction of all curves of the form $\rho = P(f_1, f_2, f_3, f_4, f_5, f_6)$, P being a polynomial and $f_1, \cdots f_6$ the six trigonometric functions. The construction may be applied to curves in parameter form and thus a class of curves not comprehended in (*a*) may be included. Thus most of the curves ordinarily arising in an analytic geometry course may be plotted without the cumbrous processes of the method by means of a table. For curves in polar coördinates additional power in determining their properties is gained.

2. Professor Lunn spoke of the blending of geometry, mechanics, and geometric optics which forms the experimental basis of elementary physical theory, emphasizing the meaning of equality of lengths in different places, of time intervals, and of the Pythagorean proposition as an experimental result, illustrating by contrast with the non-Euclidean character of geodesy on a large scale. He then showed how similar considerations led Einstein to consider space and time measurements as aspects of a single geometry, whose approximately Euclidean nature adapts it to the description of a wide range of physical relations and where the departures from the Pythagorean relation make it possible to define mass and motion and deduce the laws of hydrodynamics as geometric theorems.

3*a*. A brief historical survey of the problem of the relation between matter and ether was presented by Professor Blake including the Michelson-Morley experiment and the recent experiments of Majorana. The Fitzgerald-Lorentz contraction was then discussed and the way in which the restricted principle of relativity of Einstein (1905) accounted for all the negative results of experimenters was given. Brief comment was then made upon the generalized principle of relativity and it was shown that, if a generalized principle of least action for a four dimension continuum is to include all the laws of physics, one and the same Hamiltonian function must explain them, including the laws of radiation rather than breaking up that function into a series of additive independent terms.

3*b*. President Chamberlain discussed a new type of instrument for use in experiments on the ether drift. A combination of interferometer and diffraction grating produces a new type of interference possessing a high sensitiveness and freedom from disturbances. An interference system shown in the diffracted image produced by a grating, the lines of which are parallel with the interference fringes, consists of a narrow band of light crossed by sharp interference bands. The sensitiveness of the instrument depends upon the distance between the interference system and the diffraction grating. As the interfering paths are closely parallel over the greater part of their length the instrument is quite free from disturbance.

3*c*. Professor Miller reviewed the history of the experiments relating to ether drift which have been conducted at Cleveland, beginning with the famous Michelson-Morley experiment, down to the later Miller-Morley experiment.

Lantern slides were used to illustrate the apparatus and methods. Incidents of historical interest were related and particular attention was called to a persistent occurrence at the last experiments of a small displacement of the fringes, far less than the theory calls for, which has never been satisfactorily explained.

4. This lecture was fully reported in *Science*, March 26, 1920, pp. 301–311.

5. In the round table discussion, Mr. Beatty summarized the replies to questionnaires mailed out to about fifty of the leading high schools of Ohio. These reveal a tendency to minimize the amount of mathematics required for graduation. One unit each of algebra and geometry is required. In most cases one half unit each of advanced algebra and soild gometry is offered as an elective, but in many cases is not elected by the pupil. There is a tendency for more pupils to enter college deficient in a half-unit or more of mathematics. There was a feeling expressed that the same care in selecting teachers of mathematics was not exercised nor the same respect accorded mathematics as was done in former years. The opinion seemed to prevail that there was no more reason for discouragement over results in mathematics than in other subjects.

G. N. ARMSTRONG, *Secretary-Treasurer.*

THE APRIL MEETING OF THE ROCKY MOUNTAIN SECTION.

The fourth regular meeting of the Rocky Mountain Section was held at Colorado College, Colorado Springs, Colorado, April 2, 3. There were two sessions, presided over by Professor C. H. Sisam.

The attendance was twenty-five, including the following fourteen members of the Association: I. M. DeLong, J. C. Fitterer, W. H. Hill, H. A. Howe, Claribel Kendall, G. H. Light, J. Q. McNatt, S. L. Macdonald, O. A. Randolph, H. E. Russell, C. H. Sisam, C. S. Sperry, C. E. Stromquist, J. W. Woodrow.

The officers appointed for the meeting to be held at Denver in 1921 are: Chairman, H. A. HOWE, Denver University; Vice-chairman, W. H. HILL, Greeley High School; Secretary-Treasurer, G. H. LIGHT, Univ. of Colorado.

The following eight papers were read:

(1) "Some physical correlations in a group of one hundred S. A. T. C. men" by Professor J. C. FITTERER;

(2) "Families of curves whose evolutes are similar curves" by Professor G. H. LIGHT;

(3) "Grades for different placings of ears of corn" by Professor W. V. LOVITT;

(4) "Ionization in the mercury arc" by Professor J. W. WOODROW;

(5) "Discussion of the cycloidal curve" by Mr. J. Q. MCNATT;

(6) "Projective differential geometry in a four space" by Professor W. V. LOVITT;

(7) "The teaching of logarithms and slide rule in the first year of high school" by Professor C. E. STROMQUIST;

(8) "On ruled surfaces whose asymptotic curves are cubics" by Professor C. H. SISAM.